Multipurpose Dry mix applicable in sweet and savoury food applications

Technical Field

The present invention relates to a multipurpose dry mix which has a good freeze-thaw stability, good baking stability and viscosity stability in acid, alkaline and neutral conditions. It comprises fat, carbohydrates, and proteins, and emulsifiers and can be mixed with a variety of food ingredients.

Background of the invention

In the food processing industry, high quality, convenience, longer shelf-life, easier storage conditions and high appeal to sight, touch, taste and smell is demanded.

New trends such as more natural, healthier, more nutrious, environmental friendliness, and freshness, are but a few examples of what is requested. Preferably tasty food with more convenience is wanted.

Products comprising tasty fillings are currently prepared according to two distinct processes. The first process is a two-step process wherein the casing is baked separately from the filling, followed by injection of the filling. This prevents dehydration of the filling and/or leaking of the filling during baking of the casing. In the second process, the casing is filled with the filling and the casing is coated to prevent leaking and/or dehydration of the filling.

EP 951 845 provides a process for manufacturing savoury products comprising a filling surrounded by a crisp coating. The filling is deposited inside a flour-based shell coated with beaten egg.

GB 2 172 184 relates to a sandwich-type snack product comprising a bread casing and savoury filling. The casing is prepared from a dough of whole meal flour, dried gluten, egg protein and diacetyl tartaric acid esters. Prior to baking the snack is brushed with melted butter.

DD 229 587 describes a filling suitable for waffles and the filling and the waffle casing are sticking good together.

EP 0 194 780 relates to a sandwich-type product and especially the type of casing is described in detail.

GB 2 154 851 relates to a filled cooked dough product, its frozen counterpart and a method of reheating the same.

There is a need for having a filling which can be applied in sweet as well as in savoury products, which further can be used in cold, baked and fried applications, and which can be frozen and re-heated, while the filling is stable, non-leaking.

The current invention provides such a versatile product.

Summary of invention

The current invention relates to a multipurpose dry mix (A) for use in spread, and/or filling of baked, fried, or uncooked savoury and/or sweet tasting products,

a) Having a freeze-thaw stability of at least 98%, preferably more than 98.5%, more preferably more than 99.0%, wherein said freeze thaw stability is defined as (100% - ((100 x the total amount of separated water in ml)/(total weight in grams of mixture (B))), and wherein said mixture (B) is having a dry substance of 64% and is consisting of said dry mix (A) and water, and said total amount of separated water is collected after performing three times a procedure wherein said mixture (B) is subjected to freezing at –18°C for 24 hours, followed by thawing for 8 hours at ambient temperature, and collecting the separated water, and repeating twice said procedure, and

b) Having a baking stability of 100% wherein said baking stability is measured by baking in alumina cup at 180°C for 1 hour a mixture (C) having a dry substance of 79%, and consisting of said dry mix (A) and water, and obtaining a baked mixture (C) and said baking stability of 100% corresponds to non-leaking of a mixture (C) and/or baked mixture (C) out the alumina cup, and,

c) Having a stable viscosity under alkaline, acidic and neutral pH conditions when measuring for a mixture (D), at dry substance of 31% of said dry mix (A) in demineralised water or buffer, Brabender viscograms between 50°C and 95°C with heating rate of 1.5°C/min.

The current invention relates to a dry mix that is fulfilling previous criteria and comprises fat, proteins, and carbohydrates. Specifically, it relates to a dry mix that comprises 10-20% w/w proteins, 25-65% w/w carbohydrates, and 15-28% w/w fat. Preferably, the proteins are vital wheat gluten and/or vital wheat gluten developed in non-aqueous media.

Furthermore, the current invention relates to a dry mix wherein the carbohydrates are selected from the group consisting of starch, flour, fibers, starch hydrolysates, emulsifying starches, hydrogenated starch hydrolysates, disaccharides, monosaccharides, polyols and mixtures thereof. The emulsifying starch is starch n-octenyl succinate, preferably stabilised starch n-octenyl succinate.

The current invention further relates to a dry mix comprising:

a) 10-20% w/w gluten;
b) 20-45% w/w starch hydrolysates;
c) 5-15% w/w flour,
d) 1-10% w/w starch n-octenyl succinate, and
e) 15-28% w/w fat.

In a further embodiment, it relates to a dry mix comprising:

a) 12-25% w/w gluten;
b) 22-40% w/w starch hydrolysates;
c) 7-12% w/w flour,
d) 2-8% w/w starch n-octenyl succinate
e) 17-25% w/w fat.

The current invention relates to a completed mix comprising:

a) the dry mix according to the present invention, and
b) a liquid selected from the group consisting of water, savoury sauce, sweet sauce, dressing, fruit puree, vegetable puree, dairy-based liquids and mixtures thereof.

Furthermore, the current invention relates to a food composition, which comprises:

a) meat, fish, poultry, seafood, rice, potato, dairy products, fruits and/or vegetables, and
b) the dry mix according to the present invention, and/or
c) the completed mix according to the present invention.

The current invention further relates to a food product selected from the group consisting of snacks, pies, pizza-like products, savoury filled products, sweet bakery products and said food product is comprising a layer on, under and/or around the completed mix according to the present invention, and/or the food composition according to the present invention. Said layer is pastry, crumble, bread, biscuits, sponge, cake batter, bread-crumbs, potato slices, potato mash, mixtures thereof and the like.

The current invention further relates to a spread comprising the completed mix of the present invention.

Furthermore, the current invention relates to the use of a dry mix comprising 10-20% w/w proteins, 25-65% w/w carbohydrates, and 15-28% w/w fat, as a multifunctional mix in spreads, or fillings in baked, fried, or uncooked savoury and/or sweet tasting products. In addition, it relates to the use of a dry mix comprising 10-20% w/w gluten; 20-45% w/w starch hydrolysates; 5-15% w/w flour, 1-10% w/w starch n-octenyl succinate, and 15-28% w/w fat as a multifunctional mix in spreads or fillings in baked, fried, or uncooked savoury and/or sweet tasting products.

Description of the figures

Figure 1: digital photograph of a baked completed mix, which was baked at 180°C for 1 hour and said completed mix is consisting of 80 ml water and 300 g dry mix (45.7g vital wheat gluten, 82.3g starch hydrolysate (Cerestar C☆Dry MD 01921), 16.0g sorbitol (Cerestar C☆Sorbidex P16616), 7.3g defatted soya (Cargill), 27.4g wheat flour (Meneba Lepelaar), 27.4g dried glucose syrup (Cerestar C☆DryCream 01978), 13.7g n-OSA starch (Cerestar C☆EmTex 12688), 9.1g n-OSA starch (Cerestar C☆EmTex 06328), 68.6g fat (Vana Grasa 80C), 1.8g Salt, 0.5g Ascorbic acid, 0.1g Cysteine)

Figure 2: Brabender viscogram recorded between 50-95°C at a heating rate of 1.5°C/min for:

a) 150 g dry mix in 330 ml water (pH as is (6.3)),
b) 150 g dry mix in Buffer pH 4 (Titrisol Merck 1.09884)
c) 150 g dry mix in Buffer pH 9 (Titrisol Merck 1.09889)

The dry mix is (22.85g vital wheat gluten, 41.15g starch hydrolysate (Cerestar C☆Dry MD 01921), 8.0g sorbitol (Cerestar C☆Sorbidex P16616), 3.65g defatted soya (Cargill), 13.7g wheat flour (Meneba Lepelaar), 13.7g dried glucose syrup (Cerestar C☆DryCream 01978), 6.85g n-OSA starch (Cerestar C☆EmTex 12688), 4.55g n-OSA starch (Cerestar C☆EmTex 06328), 34.4g fat (Vana Grasa 80C), 0.9g Salt, 0.25g Ascorbic acid, 0.05g Cysteine)

Figure 3A: digital photograph of frozen savoury completed mix and ham in puff paste.
Figure 3B: digital photograph of baked savoury completed mix with ham and puff paste.
Figure 4: digital photograph of completed mix placed in snack cups covered with shredded cheese
Figure 5: digital photograph of baked sweet application of completed mix mixed with peaches in pastry
Figure 6A: digital photograph of cake with food composition comprising slices of apples and raisins after baking, freezing and thawing.
Figure 6B: digital photograph of cake with food composition comprising slices of apples and raisins after baking, freezing

Detailed description

The current invention relates to a multipurpose dry mix (A) for use in spread, and/or filling of baked, fried, or uncooked savoury and/or sweet tasting products,

a) Having a freeze-thaw stability of at least 98%, preferably more than 98.5%, more preferably more than 99.0%, wherein said freeze thaw stability is defined as (100% - ((100 x the total amount of separated water in ml)/(total weight in grams of mixture (B))), and wherein said mixture (B) is having a dry substance content

of 64% and is consisting of said dry mix (A) and water, and said total amount of separated water is collected after performing three times a procedure wherein said mixture (B) is subjected to freezing at –18°C for 24 hours, followed by thawing at ambient temperature for 8 hours, and collecting the separated water, and repeating twice said procedure, and

b) Having a baking stability of 100% wherein said baking stability is defined by baking in alumina cup at 180°C for 1 hour a mixture (C) having a dry substance content of 79%, and consisting of said dry mix (A) and water, and obtaining a baked mixture (C) and said baking stability of 100% corresponds to non-leaking of a mixture (C) and/or baked mixture (C) out the alumina cup, and

c) Having a stable viscosity under alkaline, acidic and neutral pH conditions when measuring for a mixture (D), at dry substance of 31% of said dry mix (A) in demineralised water or buffer, Brabender viscograms between 50°C and 95°C with heating rate of 1.5°C/min.

For a multipurpose mix, it is essential that a mixture comprising said dry mix is freeze-thaw stable. The freeze-thaw stability of the dry mix is determined by measuring the separation of water after freezing and thawing. The test is as follows: 300 g of the dry mix is solubilised in 170 ml of water for obtaining mixture (B), which is corresponding to a dry substance of 64%. Three plastic cups are each filled with 110 g of said mixture (B). These cups are placed for 24 hours in a standard freezer at –18°C. After 24 hours the three cups are thawed at ambient temperature (25°C). The separated water after 8 hours thawing of one of these cups is collected and the two other cups are placed again after 8 hours thawing for 24 hours in the freezer at –18°C. The thawing and collection of the separated water is repeated further two times. The total amount of the separated water is collected and the freeze thaw stability is expressed as

(100% - ((100 x the total amount of separated water in ml)/(total weight of mixture (B) (in grams)),

I.e. a total amount of separated water (after 3 cycles of freezing and thawing) of 2 ml based upon 110 g of mixture (B) gives a freeze thaw stability of 98%. A freeze thaw stability of 98.5% corresponds with a total amount of separated water of 1.65 ml. Most

preferably the freeze-thaw stability is more than 99.1%, which corresponds to less than 1 ml of total amount of separated water.

A further essential feature of a multipurpose mix is its baking stability. For measuring the baking stability of the dry mix, 300 g of dry mix are solubilised in 80 ml of water for preparing mixture (C), having a dry substance of 79%. Alumina cups are filled with 160 g of said mixture (C) and are baked for 60 minutes at 180°C in a Probat oven.

100% baking stability means that neither the baked nor unbaked mixture is leaking out the alumina cup. Furthermore, the baked product is very uniformly baked (see figure 1). The volume can rise in an appropriate way but none of the mixture is leaking out of the cup.

The dry mix of the current invention is further characterised by its stable viscosity under neutral, as well as alkaline or acidic pH conditions when recording the Brabender viscograms between 50°C and 95°C with heating rate of 1.5°C/min. The viscograms are recorded for 150 g dry mix solubilised in 330 ml water or buffer for obtaining mixture (D), at dry substance of 31%. Products that have a stable viscosity in neutral, alkaline and acid stable give a profile as demonstrated in Figure 2. For a stable viscosity there is no significant drop of the viscosity during heating in acid, neutral or alkaline media. Especially the high acid stability (at pH 4) is important and this further supports its multifunctional application.

The dry mix of the current invention is multifunctional (is multipurpose dry mix), and it can be combined with sweet, bitter, sour and salty flavours without any limitation. It can be applied as is, i.e. without any extra treatment such as cooking, baking or frying. Alternatively the dry mix of the current invention is suitable for cooking, baking or frying as well, and it can be frozen and followed by re-heated in a conventional way or in the microwave without damaging the mix.

The current invention relates to a dry mix that comprises fat, proteins, and carbohydrates.

Fat can be from animal or vegetable source.

The proteins are selected from the group consisting of vegetable proteins, cereal proteins and animal proteins. Cereal proteins can refer to proteins from sources like wheat, in particular wheat gluten, maize, barley, rye, millet. It can further include

proteins from tuberous plants such as for instance potatoes, from pulse such as soya, peas, beans. In respect of animal proteins it can refer to collagen, gelatin, lactoproteins, egg proteins, and combinations thereof. Preferably the dry mix is containing wheat proteins, more preferably wheat gluten. Wheat gluten is defined as vital wheat gluten, fractions of vital wheat gluten, modified wheat gluten, (partially) hydrolysed wheat gluten, vital wheat gluten developed in non-aqueous media, and mixtures thereof. The gluten in the current dry mix can be vital gluten developed in non-aqueous media according to the process described in EP 1 066 759. Preferably vital wheat gluten is applied.

The carbohydrates are selected from the group consisting of starch, flour, starch hydrolysates, dextrins, fibers, hydrogenated starch hydrolysates, emulsifying starches, disaccharides, monosaccharides, polyols and mixtures thereof.

Starch hydrolysates are produced by the controlled acid or enzymatic hydrolysis of starch and can be subdivided into two specific categories, maltodextrins and glucose syrups and are characterized by DE number (dextrose equivalent). In fact, DE number is a measurement of the percentage of reducing sugars present in the syrup and calculated as dextrose on a dry weight basis. Maltodextrins have a DE number up to 20 whereas glucose syrups have an DE number greater than 20.

The hydrogenated starch hydrolysates correspond to the starch hydrolysates previously defined followed by an appropriate hydrogenation which transforms the reducing end of the starch hydrolysate into a non-reducing end (i.e. polyol-type).

Dextrins are prepared according to the dextrinisation method. Dextrinisation is a heat treatment of dry starch in presence or absence of acid.

Eventually, low-calorie fibers such as polydextrose, arabinogalactan, chitosan, chitin, xanthan, pectin, cellulosics, konjac, gum Arabic, soy fiber, inulin, hydrolysed guar, guar gum, beta-glucan, carageenan, locust bean gum, alginate, polyglycol alginate and the like, can be added as well.

Flour can be cereal flour, preferably any type of wheat flour, more preferably white wheat flour, most preferably a white wheat flour having a protein content of 10.5-11% (w/w).

The monosaccharides include tetroses, pentoses, hexoses and ketohexoses, and the like.

Typical disaccharides include sucrose, maltose, isomaltulose, trehalose, neotrehalose, trehalulose, melibiose, kojibiose, sophorose, laminaribiose, isomaltose, gentiobiose, cellobiose, mannobiose, lactose, leucrose, maltulose, turanose and the like.

The polyol can be selected from tetritols, pentitols, hexitols, and higher polyols, and the like. The polyol can be but is not limited to erythritol, xylitol, arabinitol, sorbitol, mannitol, iditol, galactitol, maltitol, isomaltitol, isomalt, lactitol, mixtures thereof and the like.

The emulsifying starch is preferably starch n-octenyl succinate, more preferably stabilised starch n-octenyl succinate. Starch n-octenyl succinate (= nOSA-starch) is further characterised by its substitution degree which varies between 0.2 to 3%, preferably between 0.5 to 2.5% (determined by HPLC). The starch n-octenyl succinate can be undextrinized, dextrinized, cooked-up, pregelatinized, stabilised and/or mixtures thereof. These products can be prepared either way: first succinilation with n-octenyl succinic anhydride, followed by dextrination, gelatinisation or cooking-up or having first a dextrinised, gelatinised or cooked-up product followed by succinilation.

For obtaining the stabilised starch n-octenyl succinate, it can be treated with active chlorine and can be prepared according to the process described in EP 0811633.

Preferably the carbohydrates are mixtures of starch hydrolysates, flour, n-OSA-starch and polyols. More preferably the polyol is sorbitol.

The dry mix further can contain in minor amounts amino acids, antioxidants, vitamins, trace elements, electrolytes, edible acids, flavours and/or mixtures. In respect of sweet applications intense sweeteners can be added as well.

Among the major physiological electrolytes are sodium, potassium, chloride, calcium, and magnesium. Further trace elements can be included such as chromium, copper, selenium, iron, manganese, molybdenym, zinc and mixtures thereof.

Among the vitamins one can range vitamin A, vitamin C, vitamin E, vitamin B_{12}, and the like.

The edible acids can be selected from phosphoric acid, citric acid, malic acid, succinic acid, adipic acid, gluconic acid, tartaric acid, fumaric acid and mixtures thereof.

The flavours can be selected among the edible flavours which will be applicable according to the multifunctional application of the current disclosed dry mix.

The amount of flavour depends upon the flavour or flavours selected, the flavour impression desired and the form of flavour used.

If desired, colouring agents can also be added. Any soluble colouring agent approved for food use can be utilized for the current invention.

An intense sweetener, which can be used as non-nutritive sweetener can be selected from the group consisting of aspartame, acesulfame salts such as acesulfame-K, saccharins (e.g. sodium and calcium salts), cyclamates (e.g. sodium and calcium salts), sucralose, alitame, neotame, steviosides, glycyrrhizin, neohesperidin dihydrochalcone, monatin, monellin, thaumatin, brazzein and mixtures thereof.

Specifically, the current invention relates to a dry mix that comprises 10-20% w/w proteins, 25-65% w/w carbohydrates, and 15-28% w/w fat,

The current invention further relates to a dry mix comprising:

a) 10-20% w/w gluten;
b) 20-45% w/w starch hydrolysates;
c) 5-15% w/w flour,
d) 1-10% w/w starch n-octenyl succinate, and
e) 15-28% w/w fat.

In a further embodiment, it relates to a dry mix comprising:

a) 12-25% w/w gluten;
b) 22-40% w/w starch hydrolysates;
c) 7-12% w/w flour,
d) 2-8% w/w starch n-octenyl succinate
e) 17-25% w/w fat.

In a preferred embodiment the dry mix of the current invention is comprising 15% vital wheat gluten, 37% starch hydrolysate, 5% sorbitol, 9% wheat flour, 8% n-OSA starch and 23% fat.

In a further preferred embodiment the dry mix is comprising 15% vital wheat gluten, 37% starch hydrolysate, 5% sorbitol, 9% wheat flour, 8% n-OSA starch and 23% fat, and 2.4% defatted soya.

The dry mix can be further enriched with skimmed milk powder, vitamins, amino acids, flavours, trace elements, electrolytes, mixtures thereof and the like.

The current invention relates to a completed mix comprising:

a) the dry mix according to the present invention, and
b) a liquid selected from the group consisting of water, savoury sauce, sweet sauce, dressing, fruit puree, vegetable puree, dairy-based liquids and mixtures thereof.

Typical examples of this liquid, but without any limitation, are water, milk, tomato sauce, ketchup, cheese sauce, Bolognaise sauce, vegetable based sauce, buttermilk, liquid pudding, yoghurt, fruit flavoured sauces (e.g; cherry sauce, rhubarb sauce, peach sauce, blueberry cassis sauce) apple puree, apricots puree, rhubarb puree, vegetable puree, caramel sauce, chocolate sauce, mocha fudge sauce, honey sauce, cream Anglaise, nut topping, and the like.

The completed mix is based on a weight ratio of dry mix to liquid from 1:0.5 to 1:2.

Surprisingly, it is found that the dry mix of the current invention can be mixed with either of these sauces i.e. savoury as well as sweet tasting sauces, and yet the original taste of the sauce is not hampered. This is for example further proven by a taste panel, wherein 20 persons are requested to compare the taste of apple puree (commercial product) with a completed mix consisting of one part (weight) dry mix (comprising 15% vital wheat gluten, 37% starch hydrolysate, 5% sorbitol, 9% wheat flour, 8% n-OSA starch, 23% fat, 2.4% defatted soya) and 2 parts (weight) of said apple puree (commercial product). The apple flavour is still distinct present and the overall acceptability is as good as the commercial apple puree. Although 1/3 of the weight of the original apple puree is replaced by the dry mix of the current invention, the overall acceptability is equally good and yet the completed mix has far more potential (multipurpose use and application) compared to the commercial apple puree.

Additives such as flavours, amino acids, edible acids, vitamins, and/or colours can be added to the completed mix.

One part (weight) of a dry mix comprising 15% (weight) vital wheat gluten, 31% starch hydrolysate, 5% sorbitol, 9% wheat flour, 23% fat, 8 % n-OSA starch, 6% skimmed milk powder, and 2.4% defatted soya, is mixed with two parts of buttermilk. This completed mix can be applied as such (as spread) (see figure 4)or can be placed on a layer suitable for baking.

One part (weight) of a dry mix comprising 15% (weight) vital wheat gluten, 31% starch hydrolysate, 5% sorbitol, 9% wheat flour, 23% fat, 8 % n-OSA starch, 6% skimmed milk powder, and 2.4% defatted soya, is mixed with 0.9 parts of liquid, for example cheese sauce, for obtaining completed mix.

One part (weight) of a dry mix comprising 15% (weight) vital wheat gluten, 31% starch hydrolysate, 5% sorbitol, 9% wheat flour, 23% fat, 8 % n-OSA starch, 6% skimmed milk powder, and 2.4% defatted soya, is mixed with 1 part of liquid, for example Bolognaise sauce, for obtaining completed mix.

Said completed mix can be obtained by mixing first the ingredients of the dry mix followed by addition of the liquid. The completed mix can equally well be prepared by mixing all ingredients, including liquid, all together in one pot. This mixing step is optionally followed by freezing, baking, or frying eventually again followed by freezing, and re-heating. The re-heating can be performed in a conventional manner or in a microwave oven.

This completed mix can be consumed as such, as spread onto bread, toast or biscuits, snacks, snack cups, or it can be placed into a casing (e.g. pastry, sponge, crumble, biscuits, cake batter, bread, bread-crumbs) and it can be baked, fried, or cooked.

Surprisingly, it is observed that the fried completed mix is not deformed, non-leaking, and the originally volume of the non-fried completed mix is only to a minor (negligible) extend increased after frying. Preferably the fried completed mix has the same volume as the original non-fried completed mix.

Furthermore, the current invention relates to a food composition which is comprising:

a) meat, fish, poultry, seafood, rice, potato, dairy products, fruits and/or vegetables, and
b) the dry mix according to the present invention, and/or
c) the completed mix according to the present invention.

Preferably a food composition is comprising meat, fish, poultry, seafood, rice, potato, dairy products, fruits and/or vegetables, and the completed mix wherein the dry mix is already mixed with a liquid. Eventually, the mix of the completed mix and the dry mix can be put together with the other ingredients such as meat, fish, poultry, seafood, rice, potato, dairy products, fruits and/or vegetables for obtaining the food composition.

The food composition can be consumed as such, or it can be baked, cooked or fried. Re-heating is also possible in a conventional oven or microwave oven. Before and/or after baking or frying the baked or fried food composition can be stored in the freezer. Afterwards it can be re-heated in a microwave oven or heated in a conventional oven. Alternatively, the food composition is partially baked, or parfried followed by freezing and final baking.

Alternatively, it can be placed into a casing (e.g. pastry, crumble, biscuits, sponge, cake batter, bread, bread-crumbs) and it can be baked, or fried.

The current invention further relates to a food product selected from the group consisting of snacks, pies, pizza-like products, savoury filled products, sweet bakery products and said food product is comprising a layer on, under and/or around the completed mix according to the present invention, and/or the food composition according to the present invention. Said layer is pastry, crumble, sponge, bread, biscuits, cake batter, bread-crumbs, potato slices, potato mash, mixtures thereof and the like.

Further ingredients can be binders, further additives such as flavours, amino acids, edible acids, vitamins, and/or colours.

Furthermore, the sweet bakery products can be filled bread, bread-rolls, pound cake, sponge cake, chiffon cake, cheesecake, fruitcake, pancakes, waffles, biscuits, layer cake and gingerbread and the like.

The dry mix of the current invention is suitable for any product requiring a filling and which is then consumed as such, baked or fried.

One part (weight) of a dry mix comprising 15% (weight) vital wheat gluten, 31% starch hydrolysate, 5% sorbitol, 9% wheat flour, 23% fat and 8 % n-OSA starch, 6% skimmed milk powder, 2.4% defatted soya, is mixed with 0.9 parts of cheese sauce and a little bit of ham is put on a puff paste. The total can then be baked for obtaining savoury snacks.

35 weight% of a dry mix comprising 15% vital wheat gluten, 37% starch hydrolysate, 5% sorbitol, 9% wheat flour, 7% n-OSA starch, 23% fat, and 2.4% defatted soya, is mixed with 65% by weight of apple puree (commercial base) and is then brought on top of laminated pastry dough. Pieces of peaches can be placed on top of the completed filling, and the total is closed with pastry dough layer, before baking. The final result is a sweet bakery product (see figure 5).

21% (by weight of a dry mix comprising 15%vital wheat gluten, 37% starch hydrolysate, 5% sorbitol, 9% wheat Flour, 7% n-OSA starch, 23% fat, and 2.4% defatted soya, is mixed with 10% cottage cheese™ and 39% buttermilk. According to needs fruit pieces such as raisins and apples can be added. The total can then be brought on top of butter dough and is further covered with a cake batter. Everything is placed in the oven and a filled cake is obtained. Said product can be stored in the freezer without suffering from freeze-thaw instability (see figure 6A, 6B).

The food product can be obtained by simply mixing all the ingredients and eventually followed by baking, frying or freezing. Prior or after mixing with meat, fish, poultry, seafood, rice, potato, dairy products, fruits and/or vegetables, the mix is baked, fried or frozen. After this treatment the product can be frozen and re-heated in a conventional manner or in a microwave oven.

The current invention further relates to a spread comprising the completed mix of the present invention. Further ingredients can be additives such as flavours, amino acids, edible acids, vitamins, and/or colours.

Furthermore, the current invention relates to the use of a dry mix comprising 10-20% w/w proteins, 25-65% w/w carbohydrates, and 15-28% w/w fat as a multifunctional mix in spreads, or fillings in baked, fried, or uncooked savoury and/or sweet tasting products. In addition, it relates to the use of a dry mix comprising 10-20% w/w gluten; 20-45% w/w starch hydrolysates; 5-15% w/w flour, 1-10% w/w starch n-octenyl

succinate, and 15-28% w/w fat as a multifunctional mix in spreads or fillings in baked, fried, or uncooked savoury and/or sweet tasting products.

The current invention has the following advantages:

- providing a unique multipurpose dry mix without existing equivalent
- completed mix or food composition can be used as such (in cold preparations and/or snacks or toasts)
- it can be baked, fried, frozen prior or after baking or frying process and re-heated in microwave.
- any taste can be obtained by mixing with appropriate sauce and/or food components such as meat, fish, poultry, seafood, rice, potato, dairy products, fruits and/or vegetables
- applicable in savoury and sweet tasting products
- The preparation process is a simple one-step process and no leaking or dehydration of the filling is observed.
- Final product is not suffering from detaching between casing and filling.
- The current invention provides a completed mix that is freeze-thaw stable, short and which has a smooth texture.
- The current invention is allowing a convenient instant and cold preparation.
- It has a high water/fat binding stability, e.g. to pick up the drip water of vegetables, to bind oil/fat
- The completed mix has a very good viscosity, ideal to pump and/or to spread
- The completed mix or food composition remains smooth and stable after heating and/or re-heating
- The dry mix has an optimal neutral taste
- The dry mix has a long shelf life time and is non-dusting and is easy to transport
- It has a constant quality and a very high acid and heat stability
- It has a good shear stability and good emulsion stability

The current invention is illustrated by way of the following examples.

Example 1

Dry mix – ingredients	Weight (g)
Vital wheat gluten (Cerestar)	50
Starch hydrolysate (Cerestar C☆Dry MD 01921)	90
Sorbitol (Cerestar C☆Sorbidex P16616)	17.5
Defatted Soya (Cargill)	8
Wheat Flour (Meneba Lepelaar)	30
Dried glucose syrup (Cerestar C☆DryCream 01978)	30
n-OSA starch (Cerestar C☆EmTex 12688)	15
n-OSA starch (Cerestar C☆EmTex 06328)	10
Fat (Vana Grasa 80C)	75
Salt	2
Ascorbic acid	0.6
Cysteine	0.1
Total	328.2

The dry mix ingredients were mixed together.

1. **Freeze-thaw stability**

The total amount of separated water after one, two and three freeze-thaw cycles was determined (procedure).

Equipment:
Hobart mixer N50
Whisk NSF-N50
Plastic cups with the following dimensions: Heighth 42mm; Diameter bottom: 53mm, top 62 mm.

Funnel, diameter 110mm
Faltenfilter, diameter 185mm
Calibrated cylinder: 50ml

Freezer: Bosch ***

Method:
The Hobart bowl was filled with 170 ml water.
300 g of dry mix (45.7g vital wheat gluten, 82.3g starch hydrolysate (Cerestar C☆Dry MD 01921), 16.0g sorbitol (Cerestar C☆Sorbidex P16616), 7.3g defatted soya (Cargill), 27.4g wheat flour (Meneba Lepelaar), 27.4g dried glucose syrup(Cerestar C☆DryCream 01978), 13.7g n-OSA starch (Cerestar C☆EmTex 12688), 9.1g n-OSA starch (Cerestar C☆EmTex 06328), 68.6g fat (Vana Grasa 80C), 1.8g Salt, 0.5g Ascorbic acid, 0.1g Cysteine) was added to the water while stirring for 30 seconds at slow speed using whisk.
After water pickup the completed mix was stirred for two minutes at speed two.
Three plastic cups were filled each with 110 grams of completed mix and then covered with plastic lid. The three filled cups were placed in a standard freezer (Bosch ***) at -18 °C.
After 24 hours of storage one cup was emptied on the Faltenfilter. The Faltenfilter was placed into a funnel and emptied in a calibrated cylinder of 50 ml. During 8 hours of thawing at room temperature, the amount of separated water was collected and determined. The other filled cups remained for 8 hours thawing at room temperature (25°C), and were placed in the freezer again.
This procedure was repeated two times and the total amount of separated water was determined.
The total amount of separated water (after the three collections) was less than 1 ml.

The freeze thaw stability (in percentage) = (100% - ((100 x the total amount of separated water in ml)/(total weight (in grams) of completed mix)),

Freeze thaw stability (%) = (100 – (100 x (<1) / 110)
Freeze thaw stability (%) > 99.1%

2. **Baking Stability**

Equipment:
Tray lab oven: Probat Model: Domino, Type: 2/62/81/20
Hobart N50
Whisk NSF-N50
Aluminium cups: volume 160ml.

Method:
The Hobart bowl was filled with 80 ml water.
300 g dry mix (45.7g vital wheat gluten, 82.3g starch hydrolysate (Cerestar C☆Dry MD 01921), 16.0g sorbitol (Cerestar C☆Sorbidex P16616), 7.3g defatted soya (Cargill), 27.4g wheat flour (Meneba Lepelaar), 27.4g dried glucose syrup (Cerestar C☆DryCream 01978), 13.7g n-OSA starch (Cerestar C☆EmTex 12688), 9.1g n-OSA starch (Cerestar C☆EmTex 06328), 68.6g fat (Vana Grasa 80C), 1.8g Salt, 0.5g Ascorbic acid, 0.1g Cysteine) was added to the water, while stirring for 30 seconds at slow speed, by using whisk for obtaining the completed mix.
After water pickup, the completed mix was stirred for two minutes at speed two.
The aluminium cup was filled with 160 grams of completed mix.
The filled cup was placed in Probat oven and the completed mix was baked for 60 minutes at 180°C.

Observations:
During baking the unbaked completed mix was not exceeding the border of the cup.
Volume increase was acceptable but boiling effect of the filling during baking was completely excluded and no leaking of the baked or unbaked completed mix was observed. The completed mix was uniformly (homogeneously) baked.
Baking stability is 100%: neither the baked non unbaked mix was leaking.
The result is displayed in Figure 1.

3. Brabender viscograms

Equipment:

- Viscograph E (Brabender)
- Refrigerated water bath, set at 15° C
- 600 ml low-form glass beaker
- Laboratory balance having a precision of 0.01 g
- Plastic rod or spoon

Reagents:

- Standard laboratory demineralised water
- Buffer pH 4.0: Titrisol 1.09884 (Merck)
- Buffer pH 9.0: Titrisol 1.09889 (Merck)

Procedure

For the standard calibration and adjustment procedure for the Viscograph E see the instruction manual (Brabender (Nr 12014))

Sample preparation

- Place a 600 ml low-form glass beaker on the laboratory balance, and zero the balance.
- Weigh accurately 150.0 g dry mix (45.7g vital wheat gluten, 82.3g starch hydrolysate (Cerestar C☆Dry MD 01921), 16.0g sorbitol (Cerestar C☆Sorbidex P16616), 7.3g defatted soya (Cargill), 27.4g wheat flour (Meneba Lepelaar), 27.4g dried glucose syrup (Cerestar C☆DryCream 01978), 13.7g n-OSA starch (Cerestar C☆EmTex 12688), 9.1g n-OSA starch (Cerestar C☆EmTex 06328), 68.6g fat (Vana Grasa 80C), 1.8g Salt, 0.5g Ascorbic acid, 0.1g Cysteine), to the nearest 0.01 g.
- Precisely 330.0 g demineralised water, or buffer (of pH 4 or pH 9) was added to the dry mix.
- The dry mix was dispersed completely by using the plastic rod or spoon.

Settings

Temperature profile :

Starting temperature S_0	: 50 °C	Heating rate	: 1.5 °C/min
Nominal temperature S_1	: 95 °C	Holding time t_1	: 30 min
Nominal temperature S_2	: 50 °C	Cooling rate	: 1.5 °C/min
Holding time t_2	: End		

When homogeneity was achieved, the slurry was poured quantitatively into the cup of the Brabender viscometer, and the measuring head and the sensor were inserted.

The obtained results are displayed in Figure 2.
It is clearly seen that the viscosity of the dry mix of the current invention is heat stable in acid, neutral and alkaline media.

Example 2

Dry mix - ingredients	Weight (g)
Vital Wheat Gluten (Cerestar)	50
Skimmed milk powder	20
Starch hydrolysate (C☆Dry GL 01921)	90
Starch hydrolysate (C☆Dry MD 01904)	10
Sorbitol (C☆Sorbidex P16616)	17.5
Defatted Soya (Cargill)	8
Wheat Flour (Meneba Lepelaar)	30
n OSA starch (C☆EmTex 12688)	15
n OSA starch (C☆EmTex 06328)	10

Fat (Vana Grasa 80C) (De Kievit)	75
Salt	1
Ascorbic acid	0.05
Cysteine	0.1
Total:	326.65

75 g of dry mix was mixed with 150 g buttermilk followed by 12.5g pregelatinised starch (Cerestar C☆Hiform A 12747). After stirring for about 3 minutes, about 7g of said complete mix was taken and 3g apples were added and flavoured with cinnamon for obtaining the food composition.

The food composition was packed in pastry dough and baked during 15 minutes at 220°C.

The result was a sweet bakery product.

Example 3

Dry mix – Ingredients	Weight (g)
Vital Wheat Gluten	50
Skimmed milk powder	20
Starch hydrolysate (C☆Dry MD01910)	90
Starch hydrolysate (C☆Dry MD 01904)	10
Sorbitol (C☆Sorbidex P16616)	17.5
Defatted Soya (Cargill)	8
Wheat Flour (Meneba Lepelaar)	30
n OSA starch (C☆EmTex 12688)	15
n OSA starch (C☆EmTex 06328)	10
Fat (Vana Grasa 80C) (De Kievit)	75
Salt	1

Ascorbic acid	0.05
Cysteine	0.1
Total:	326.65

To 150 g of said dry mix was added 138.5 g of cheese sauce (prepared from one package of KNORR cheese sauce which was dissolved in 220 ml of water, brought to boil and allowed to boil for 1 minute), followed by 58 g Philadelphia™ nature and 3.5 g Parmesan™ Ex, for obtaining the completed mix.
The completed mix was mixed for about 3 minutes.
To make the snacks, a layer of said savoury completed mix was placed with a little bit of ham on a puff paste. The weight of the filling together with the dough amounted to about 100 g. These rolls were placed in the refrigerator. After the rolls became hard, they could easily be cut in small pieces. (see Figure 3A)
These pieces were baked during 15 minutes at 220 °C. The result was a savoury snack with a soft filling. These snacks were further dried for 40 minutes at 140°C. The result is a crispy snack (see Figure 3B).

Example 4

Dry mix – Ingredients	Weight (g)
Vital Wheat Gluten (Cerestar)	50
Skimmed milk powder	20
Starch hydrolysate (C☆Dry GL 01921)	90
Starch hydrolysate (C☆Dry MD 01904)	10
Sorbitol (C☆Sorbidex P16616)	17.5
Defatted Soya (Cargill)	8
Wheat Flour (Meneba Lepelaar)	30

n OSA starch (C☆EmTex 12688)	15
n OSA starch (C☆EmTex 06328)	10
Fat (Vana Grasa 80C) (De Kievit)	75
Salt	1
Ascorbic acid	0.05
Cysteine	0.1
Total:	326.65

150 g dry mix was mixed with 25 g of pregelatinised starch (C☆HiForm A 12747).
300 g buttermilk (strawberry taste) was added, followed by 50 g of margarine.

The ingredients were mixed for about 3 minutes to obtain the completed mix.
The thus prepared completed mix was utilised as spread on toast.

Example 5

The dry mix of example 1 was applied in the following quantities:

Ingredients	Weight percentage
Dry mix	31.7 %
Margarine (commercial base)	9.8 %
Buttermilk (commercial base)	58.5 %

The dry mix was mixed for 3 minutes with the margarine and buttermilk.
Snack cups were filled with the previously prepared formulation (completed mix). The cups were further decorated with shredded cheese.
The result is displayed in Figure 4.

Example 6

Dry mix	Weight (g)
Vital Wheat Gluten (Cerestar)	50
Skimmed milk powder	20
Starch hydrolysate (C☆Dry GL 01921)	90
Starch hydrolysate (C☆Dry MD 01904)	10
Polyol (C☆Sorbidex P16616)	17.5
Defatted Soya (Cargill)	8
Wheat Flour (Meneba Lepelaar)	30
n OSA starch (C☆EmTex 12638)	15
n OSA starch (C☆EmTex 06328)	10
Fat (Vana Grasa 80C) (De Kievit)	75
Salt	1
Ascorbic acid	0.05
Cysteine	0.1
Total:	326.65

300 g of dry mix was added to 300g Bolognaise sauce (commercial base), and 20 g pregelatinised distarch phosphate (Cerestar, C☆Pulp Tex 12930)
Everything was mixed for about 3 minutes and the savoury completed mix was cooled for 30 minutes in the refrigerator. The savoury completed mix was rolled into strands. Each strand was cut in pieces of ± 40 g. These pieces were rolled in a solution of Batter starch/ water of 50g/55 g and afterwards in bread crumbs.
The obtained croquets were frozen and afterwards were frying stable

Example 7

The dry mix of example 1 was applied in the following ratio:

35% by weight of the dry mix and 65% by weight of apple puree (commercial base)
The dry mix was added to the apple puree and the total was mixed for 3 minutes.
The completed mix was brought on top of laminated pastry dough. Pieces of peaches were placed on top of the completed filling, and the total was closed with pastry dough layer.
The filled pastry was baked for 28 minutes at 220°C.
The obtained result is displayed in Figure 5.

Example 8

The dry mix of example 1 was applied in the following weight ratios:

Ingredients	Weight (g)
dry mix	300
Pregelatinised starch (Cerestar C☆ HiForm A 12747)	50
Buttermilk (commercial base)	700
Cottage cheese™ (commercial base)	150
Raisins	125
Total	1325

The dry mix was mixed with the pregelatinised starch and the total was then added to the cottage cheese™ and the buttermilk. This mixing was performed with a wish in the Hobart mixer at speed two. The raisins were added after this mixing, and manually mixed through the previous prepared filling.

The baking plate (30 x 40 cm) was covered with standard laminated butter dough (thickness 12mm), 1150 g of filling (incl. Raisins) was poured on the butter dough. This filling was covered with 350 g sliced apples and finally 1000 g of cake dough was divided on top of the sliced apples.

The cake dough itself was prepared from :

Damco Cake Mix™	1000 g
Cake Margarine (Puratos)	500 g
Whole eggs	500 g

This cake was baked during 60 min. in the Probat oven (T_{above} =170°C; T_{below} = 225°C). The cake was cooled, and stored at 6°C for two hours and cut in pieces of 50 grams. The filling was baked well and there was no boiling effect observed. After cooling the cake, it can easily be cut into pieces without damaging the filling.
After cooling, the baked cake was packed and placed in the freezer.
After storage for 4 months at –18°C, it was checked how the filling was looking, directly after taking out of the freezer and after thawing.
The result is displayed in Figure 6A (after thawing), and Figure 6B while frozen.